

respond with the similar European forms. This attitude appears to be of very dubious value indeed, in view of the completeness of the agreement never before questioned between the American genera and even species and those of Europe as long recognized by distinguished students of both floras. This position in regard to American supposed mesozoic sequoias and their European counterparts is not the less surprising in view of the meagerness and bad state of preservation of her material, in contrast to the abundance and perfection of that from American deposits.

The volume closes with anatomical descriptions of the woody dicotyledonous genera *Cantia*, *Woburnia*, *Sabulia*, *Hythia*, and *Aptiana*, which present no feature of interest beyond vouching anatomically for the presence of the dicotyledons in the early Cretaceous.—E. C. JEFFREY.

### Hydrogen ion concentration

MICHAELIS<sup>2</sup> is the author of the first of a series of *Monographs on plant and animal physiology*. The series, which is edited by CZAPEK and PARNAS, is to bear somewhat the same relation to its realm as the well known *Monographs on biochemistry* bear to their more restricted field. Many of the proposed numbers promise to be of the greatest interest to plant physiologists. The present volume deals with hydrogen ion concentration, its significance in biology, and the methods for measuring it. In the introduction the author points out the importance of the "actual" reaction of the medium in determining the course of chemical changes in organisms, and cites instances of the misinterpretation of experimental results due to failure to consider this factor.

The monograph is divided into three parts. In the first the theoretical significance of hydrogen ion concentration is discussed. Following a development of the general principles and formulae for the dissociation of water, acids and bases, and amphoteric electrolytes, these are applied to the special cases of proteins and enzymes. By combining the results of experiments on the influence of hydrogen ion concentration on enzyme activity, and the results of transfer experiments on the same enzymes, some interesting conclusions are drawn as to the chemical nature of the enzymes studied. Invertase, for instance, is considered an amphoteric electrolyte of which only the undissociated part of the "invertase acid" is effective, and only the cations of pepsin are effective in hydrolyzing proteins.

The second part of the monograph is a statement of present knowledge as to the hydrogen ion concentration at which physiological processes go on in organisms, the variations of this factor that occur, and the means the organism possesses for regulating the acidity of its body fluids. In general, if a body fluid is characterized by a specific enzyme, the hydrogen ion concentration of the fluid corresponds to the optimum for that enzyme. The variations are

<sup>2</sup> MICHAELIS, L., *Die Wasserstoffionenkonzentration, ihre Bedeutung für die Biologie und die Methoden ihrer Messung*. Berlin. 1914.

usually small. The reaction is regulated by the salts of weak acids and bases present, and by the removal of acids by the lungs and kidneys.

The methods for measuring hydrogen ion concentration are taken up in the third part. Those based on the measurement of reaction velocity are omitted, as they are practically useless in biological work. The gas chain method is treated very thoroughly from the theoretical and practical points of view, and the formulae and tables given make the book an excellent laboratory guide for carrying out these measurements. The discussion of the indicator method is somewhat less complete. Methods for preparing solutions of a definite hydrogen ion concentration, a method for carrying out transfer experiments with colloids, and a complete bibliography are appended.

The work done in this field has been limited almost entirely to animal processes. Undoubtedly this factor is of importance in the plant as well, and investigations in this direction should furnish valuable additions to our knowledge of plant processes.—THOMAS G. PHILLIPS.

#### NOTES FOR STUDENTS

**Current taxonomic literature.**—O. AMES (Philipp. Jour. Sci. Bot. 9:11-16. 1914) under the title "Orchids of Guam" has published 8 new species.—H. ANDRES (Oesterr. Bot. Zeits. 64:232-255. 1914) in continuation of his studies on the Pirolaceae records further important data on this group.—G. ARNAUD (Bull. Soc. Myc. France 30:355-360. pls. 17-19. 1914) in an article discussing the genus *Henriquesia* characterizes a new genus (*Castagnella*) of the Dothideaceae, which is found on branches of *Quercus coccifera*.—E. G. BAKER (Jour. Linn. Soc. 42:241-246. pls. 9-14. 1914) gives a synopsis of the "African species of *Crotalaria*." The author recognizes 309 species, several of which are new to science.—I. W. BALFOUR and W. W. SMITH (Notes Roy. Bot. Gard. Edinb. 8:191. 1914) have published a new genus (*Kingdonia*) of the Ranunculaceae from China.—H. H. BARTLETT (Cybele Columbiana 1:37-56. pls. 1-5. 1914) characterizes 12 new elementary species of *Onagra*.—O. BECCARI (Webbia 4:293-385. 1914) under the title "Studio sui Borassus" includes the description of a new genus of palms (*Borassodendron*) based on *Borassus Machadonis* Becc. from the Malayan Peninsula.—R. E. BENEDICT (Bull. Torr. Bot. Club 41:291-410. pl. 20. 1914) presents a revision of the genus *Vittaria* in which 7 species are recognized, 2 being new to science.—A. BENNETT (Philipp. Jour. Sci. Bot. 9:339-344. 1914) records one new species of *Potamogeton* and a new hybrid from the Philippine Islands.—A. BÉQUINOT and N. BELOSERSKY (Atti de' Lincei.—Mem. Cl. sc. fisiche ecc. Ser. 5<sup>a</sup>. 9:595-734 [1-144]. pls. 1-12. 1913) have published a monographic revision of the genus *Apocynum*, recognizing 26 species of which 4 from the eastern United States are described as new.—E. P. BICKNELL (Bull. Torr. Bot. Club 41:411-427. 1914) in continuation of his studies on the flowering plants of Nantucket includes the Clethraceae, Pyrolaceae, and Ericaceae. New species are recorded